

REMARKS

Claims 1-46 are pending in the application. Claim 31 has been herein cancelled. Claims 1, 2, 4, 9, 10, 26, 32-34, and 46 have been amended. Applicant respectfully requests entry of the foregoing amendments to claims 1, 2, 4, 9, 10, 26, 32-34, and 46 prior to further examination. No new matter has been introduced. Acceptance is respectfully requested.

Specification Objection

The specification has been objected to because the status of the related applications paragraph should be updated. Applicant has amended the related applications paragraph as suggested by the Examiner. Applicant respectfully requests the objection to the Specification be withdrawn.

35 U.S.C. § 102 Rejection

Claims 1, 12-13, 26, 28, 35-36, and 46 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Budovich et al (U.S. Patent 6,023,169).

The present invention provides an ionization gauge 100 that isolates an electron source 140 from gas molecules in a measurement chamber 120. In the disclosed embodiment, the ionization gauge 100 includes an isolation chamber 110 and a measurement chamber 120. The isolation chamber contains the electron source 140 and an acceleration electrode 150. The measurement chamber 120 contains a deceleration electrode 170, an anode 180, and a collector electrode 190. The two chambers 110, 120 are separated by an isolation material 130 which prevents molecules and atoms of gas within the measurement chamber 120 from entering the isolation chamber 110 and degrading the electron source 140. The isolation material 130 has an electron window 160 which allows electrons to be transmitted from the isolation chamber 110 into the measurement chamber 120. (See Specification, page 4, lines 18-27; and FIG. 1).

To travel through the electron window 160, the electrons must have a high energy level. However, ion formation typically occurs at a lower energy level, for example, around 150 electron volts for nitrogen. Therefore, the energy of the electrons is modified by the deceleration

electrode(s) 170 to allow for ionization. (See Specification, page 6, lines 13-27; and FIGS. 2A and 2B).

Budovich provides an electron capture detector divided into two partial chambers 2 and 3. The chamber 2 and 3 are separated by a partition 4 made of material permeable for electrons. Partial chamber 2 includes an electron source 6 in the form of a photocathode. Partial chamber 3 includes a collector electrode 9. In operation, the photocathode 6 emits electrons which, due to the potential difference (18-25 kV) between the photocathode and grid 27, are accelerated toward grid 27. Influenced by the accelerating voltage, the electrons receive enough energy to pass through partition 4 and enter partial chamber 3. Analysis gas is supplied to partial chamber 3 through a feed line 12. If molecules from electrophilic substances are present in the analysis gas which thereby attach electrons, the electrical current (signal) tapped at collector electrode 9, amplified by electrometer 11, is changed in proportion to the concentration of these molecules. Budovich does not include a deceleration electrode. (See Budovich, col. 3, lines 3-58; and FIG. 1).

The Examiner acknowledges that Budovich does not disclose a deceleration electrode. (See Office Action, page 8, lines 7-9.) Independent claims 1, 26, and 46 have been amended to include the limitation of "a deceleration electrode". As such, Applicant respectfully requests the withdrawal of the rejection of claims 1, 26, and 46 under 35 U.S.C. § 102. Applicant respectfully requests the withdrawal of the rejections of Claims 12, 13, 26, 28, 35, and 36 based on their dependency of allowance base claims.

35 U.S.C. § 103 Rejection

Claims 2-6, 8-11 and 31-34 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Budovich in view of Bills (U.S. Patent 5,128,617, hereinafter Bills '617). Claim 31 has been herein cancelled.

Bills provides an ionization gauge and controller collecting all electrons at low energy so that soft X-ray production is negligible. As illustrated in FIG. 8, electrons that have not impacted gas molecules pass through a narrow exit slot after of the anode volume. After exiting the anode volume, the energetic electrons are decelerated by a positive bias voltage on an electron collector electrode 18" and collected on the electron collector electrode 18". The

electron collector electrode 18" is located outside the anode volume. Thus, negligible soft X-rays are produced and the X-ray limit is greatly reduced. Bills does not disclose a deceleration electrode positioned between an electron window and a collector electrode to decelerate the electrons. In Bills, electrons are decelerated for collection after passing through the impact region, not to obtain the proper energy level for ionization. (See Bills, Col. 10, lines 49-68).

Neither Budovich or Bills, alone or in combination, teach, suggest, or otherwise make obvious "a deceleration electrode between the electron window and the collector electrode" as now claimed in amended Claims 1 and 26. The combination of Budovich and Bills teaches away from the present invention because if the electron collector electrode 18" of Bills were positioned between the partition (window) 4 and the collector electrode 9 of Budovich, all the electrons would be collected by the electron collector electrode 18" before they had a chance to interact with the gas molecules and form ions. As such, no ions would be collected. Therefore, Applicant respectfully requests the withdrawal of the rejection of now amended Claim 1 under 35 U.S.C. § 103.

Dependent claims 2-6, 8-11 depend from amended Claim 1 and claims 32-34 depend from amended Claim 26 and are allowable for the same reasons. Applicant respectfully requests the withdrawal of the rejections of Claims 2-6, 8-11, 32-34.

Claims 1, 18, 24, 26, 40, 45, and 46 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Frees et al (U.S. Patent 6,468,814) in view of Budovich. Claims 1, 12-17, 19-23, 25-29, 35-39, 41-44, and 46 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Bills et al (U.S. Patent 5,422,573, hereinafter Bills '573) in view of Budovich. Claim 30 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Budovich. Claim 7 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Budovich view of Bills '617 and further in view of Frees.


Neither Budovich, Bills '617, Frees, or Bills '573, alone or in combination, teach, suggest, or otherwise make obvious "a deceleration electrode" as claimed in now amended independent claims 1, 26, and 46. As such, Applicant respectfully requests the withdrawal of rejections claims 1, 7, 12-30, 35-45, and 46 under 35 U.S.C. § 103.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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